CLAIMS:

1. (Currently amended) A mechanical resonator pair comprising, at least:

   a first mechanical resonator comprising, at least:

   a resonating mass;

   a driving mechanism through which the resonating mass of said first mechanical resonator is driven to resonate along a pre-selected axis;

   a driving feedback mechanism that provides status information of the resonance of said first mechanical resonator along the pre-selected axis ~~(such as amplitude, frequency, and phase of the resonance)~~ wherein the status information of the resonance includes amplitude, frequency, and phase of the resonance;

a second mechanical resonator with ~~its resonance~~ the resonance of said second mechanical resonator phase-locked to the resonance of said first mechanical resonator with certain preset phase difference comprising, at least:

   a resonating mass;

   a driving mechanism through which the resonating mass of said second mechanical resonator is driven to resonate along the same pre-selected axis of said first mechanical resonator;

   a driving feedback mechanism that provides status information of the resonance of said second mechanical resonator along the pre-selected axis ~~(such as amplitude, frequency, and phase of the resonance)~~ wherein the status information of the resonance includes amplitude, frequency, and phase of the resonance;

   a frequency adjustment mechanism through which ~~the natural~~ a natural resonant frequency for the resonance along the pre-selected axis of said second mechanical resonator can be adjusted by a signal~~.~~.

2. (Currently amended) A mechanical resonator pair of Claim 1, further comprising, at least:

   a circuitry that enables the ~~phase lock~~ phase-locking between the resonance of the first mechanical resonator and the resonance of the second mechanical resonator with certain preset phase difference comprising, at least:

   a feedback control block that enables the first mechanical resonator to resonate along the pre-selected axis at or close to ~~its natural resonant~~

~~frequency~~ a natural resonant frequency of said first mechanical resonator;

a feedback control block that enables the second mechanical resonator to resonate along the pre-selected axis at or close to ~~its natural resonant frequency~~ the natural resonant frequency of said second mechanical resonator;

a control loop that enables the ~~phase-lock~~ phase-locking between the resonance of the first mechanical resonator and the resonance of the second mechanical resonator with certain preset phase difference by detecting the phase difference between the resonances and accordingly adjusting the natural resonant frequency of the second mechanical resonator through the frequency adjustment mechanism of the second mechanical resonator.

3. (Currently amended) A mechanical resonator pair according to Claim 1, wherein:

~~The~~ the resonating mass of the first mechanical resonator is a movable structure suspended over a substrate and supported by a set of mechanical beams, with at least one point of each of the mechanical beams anchored on the substrate;

~~The~~ the driving mechanism of the first mechanical resonator is implemented by an electrostatic force applied on the resonating mass of the first mechanical resonator through a set of electrodes placed near the resonating mass of the first mechanical resonator and anchored on the substrate;

~~The~~ the driving feedback mechanism of the first mechanical resonator is implemented by capacitive sensing with one or more capacitors formed by the resonating mass of the first mechanical resonator and a set of electrodes placed near the resonating mass of the first mechanical resonator and anchored on the substrate;

~~The~~ the resonating mass of the second mechanical resonator is a movable structure suspended over the same substrate of the first mechanical resonator and supported by a set of mechanical beams, with at least one point of each of the mechanical beams anchored on the substrate;

~~The~~ the driving mechanism of the second mechanical resonator is implemented by an electrostatic force applied on the resonating mass of the second mechanical resonator through a set of electrodes placed near the resonating mass of the second mechanical resonator and anchored on the substrate;

~~The~~ the driving feedback mechanism of the second mechanical resonators is implemented by capacitive sensing with one or more capacitors formed by

the resonating mass of the second mechanical resonator and a set of electrodes placed near the resonating mass of the second mechanical resonator and anchored on the substrate;

The the frequency adjustment mechanism of the second mechanical resonator is implemented by an electrostatic force applied on the resonating mass of the second mechanical resonator through a set of electrodes placed near the resonating mass of the second mechanical resonator and anchored on the substrate, with the electrostatic force having a component that is linear to the relative position of the resonating mass of the second mechanical resonator and the substrate;.

4. (Currently amended) A mechanical resonator pair according to Claim 2, wherein:

The the resonating mass of the first mechanical resonator is a movable structure suspended over a substrate and supported by a set of mechanical beams, with at least one point of each of the mechanical beams anchored on the substrate;

The the driving mechanism of the first mechanical resonator is implemented by an electrostatic force applied on the resonating mass of the first mechanical resonator through a set of electrodes placed near the resonating mass of the first mechanical resonator and anchored on the substrate;

The the driving feedback mechanism of the first mechanical resonator is implemented by capacitive sensing with one or more capacitors formed by the resonating mass of the first mechanical resonator and a set of electrodes placed near the resonating mass of the first mechanical resonator and anchored on the substrate;

The the resonating mass of the second mechanical resonator is a movable structure suspended over the same substrate of the first mechanical resonator and supported by a set of mechanical beams, with at least one point of each of the mechanical beams anchored on the substrate;

The the driving mechanism of the second mechanical resonator is implemented by an electrostatic force applied on the resonating mass of the second mechanical resonator through a set of electrodes placed near the resonating mass of the second mechanical resonator and anchored on the substrate;

The the driving feedback mechanism of the second mechanical resonators is implemented by capacitive sensing with one or more capacitors formed by the resonating mass of the second mechanical resonator and a set of electrodes placed near the resonating mass of the second mechanical resonator and anchored on the substrate;

The ~~The~~ the frequency adjustment mechanism of the second mechanical
resonator is implemented by an electrostatic force applied on the resonating
mass of the second mechanical resonator through a set of electrodes placed
near the resonating mass of the second mechanical resonator and anchored
on the substrate, with the electrostatic force having a component that is
linear to the relative position of the resonating mass of the second
mechanical resonator and the substrate;

~~The~~ the control loop of the circuitry is implemented by a loop that comprises
at least a phase-detector, a low-pass filter, and the feedback control block
that enables the second mechanical resonator to resonate along the pre-
selected axis at or close to ~~its natural resonant frequency~~ the natural
resonant frequency of said second mechanical resonator~~;~~.

5. (Currently amended) A mechanical resonator pair according to Claim 2,
   wherein:

   ~~The~~ the resonating masses of the first and second mechanical resonators are
   used as the resonating masses to generate the Coriolis force in a vibration
   gyroscope utilizing Coriolis Effect.

6. (Currently amended) A vibration gyroscope utilizing Coriolis Effect
   comprising, at least:

   a first movable mass resonating at or close to ~~its natural resonate frequency~~
   a natural resonate frequency of said first movable mass along a pre-selected
   axis, where the resonance of said first movable mass along said pre-selected
   axis is to generate ~~the Coriolis~~ a Coriolis force when there is a rotation about
   an axis that is perpendicular to said pre-selected axis;

   a driving mechanism that drives the first movable mass to resonate along the
   pre-selected axis;

   a driving feedback mechanism that provides status information of the
   resonance of the first movable mass along the pre-selected axis ~~(such as
   amplitude, frequency, and phase of the resonance)~~ wherein the status
   information of the resonance includes amplitude, frequency, and phase of the
   resonance;

   a second movable mass resonating at or close to ~~its natural resonate
   frequency~~ a natural resonate frequency of said second movable mass along
   the same pre-selected axis of the first movable mass, with ~~its resonance~~ the
   resonance of said second movable mass phase-locked to the resonance of
   the first movable mass with certain preset phase difference, preferably 180
   degree or close to 180 degree;

   a driving mechanism that drives the second movable mass to resonate along
   the pre-selected axis;

a driving feedback mechanism that provides status information of the resonance of the second movable mass along the pre-selected axis ~~(such as amplitude, frequency, and phase of the resonance)~~ wherein the status information of the resonance includes amplitude, frequency, and phase of the resonance;

a frequency adjustment mechanism that adjusts the natural resonant frequency of the second movable mass for the resonance along the pre-selected axis~~;~~.

7. (Currently amended) A vibration gyroscope of Claim 6, further comprising:

a circuitry that enables the ~~phase-lock~~ phase-locking between the resonance of the first movable mass along the pre-selected axis and the resonance of the second movable mass along the pre-selected axis with certain preset phase difference comprising, at least:

a feedback control block that enables the first movable mass to resonate along the pre-selected axis at or close to ~~its natural resonant frequency~~ the natural resonant frequency of said first movable mass;

a feedback control block that enables the second movable mass to resonate along the pre-selected axis at or close to ~~its natural resonant frequency~~ the natural resonant frequency of said second movable mass;

a control loop that enables the ~~phase-lock~~ phase-locking between the resonance of the first movable mass along the pre-selected axis and the resonance of the second movable mass along the pre-selected axis with certain preset phase difference, preferably 180 degree or close to 180 degree, by detecting the phase difference between the resonances and accordingly adjusting the natural resonant frequency of the second movable mass through the frequency adjustment mechanism of the second movable mass.

8. (Currently amended) A vibration gyroscope of Claim 6, wherein:

~~The~~ the first movable mass is a movable structure suspended over a substrate and supported by a set of mechanical beams, with at least one point of each of the mechanical beams anchored on the substrate;

~~The~~ the driving mechanism for the first movable mass is implemented by an electrostatic force between the first movable mass and a first set of electrodes placed near the first movable mass and anchored on the substrate;

~~The~~ the driving feedback mechanism for the first movable mass is |
implemented by capacitive sensing with one or more capacitors formed by
the first movable mass and a <u>second</u> set of electrodes placed near the first |
movable mass and anchored on the substrate;

~~The~~ the second movable mass is a movable structure suspended over the |
same substrate of the first movable mass and supported by a set of
mechanical beams, with at least one point of each of the mechanical beams
anchored on the substrate;

~~The~~ the driving mechanism for the second movable mass is implemented by |
an electrostatic force between the second movable mass and a <u>third</u> set of |
electrodes placed near the second movable mass and anchored on the
substrate;

~~The~~ the driving feedback mechanism for the second movable mass is |
implemented by capacitive sensing with one or more capacitors formed by
the second movable mass and a <u>fourth</u> set of electrodes placed near the |
second movable mass and anchored on the substrate;

~~The~~ the frequency adjustment mechanism for the second movable mass is |
implemented by an electrostatic force applied on the second movable mass
through a <u>fifth</u> set of electrodes placed near the second movable mass and |
anchored on the substrate, with the electrostatic force having a component
that is linear to the relative position of the second movable mass and the
substrate~~;~~. |

9. (Currently amended) A vibration gyroscope of Claim 7, wherein:

~~The~~ the first movable mass is a movable structure suspended over a |
substrate and supported by a set of mechanical beams, with at least one
point of each of the mechanical beams anchored on the substrate;

~~The~~ the driving mechanism for the first movable mass is implemented by an |
electrostatic force between the first movable mass and a <u>first</u> set of |
electrodes placed near the first movable mass and anchored on the
substrate;

~~The~~ the driving feedback mechanism for the first movable mass is |
implemented by capacitive sensing with one or more capacitors formed by
the first movable mass and a <u>second</u> set of electrodes placed near the first |
movable mass and anchored on the substrate;

~~The~~ the second movable mass is a movable structure suspended over the |
same substrate of the first movable mass and supported by a set of
mechanical beams, with at least one point of each of the mechanical beams
anchored on the substrate;

The the driving mechanism for the second movable mass is implemented by an electrostatic force between the second movable mass and a third set of electrodes placed near the second movable mass and anchored on the substrate;

The the driving feedback mechanism for the second movable mass is implemented by capacitive sensing with one or more capacitors formed by the second movable mass and a fourth set of electrodes placed near the second movable mass and anchored on the substrate;

The the frequency adjustment mechanism for the second movable mass is implemented by an electrostatic force applied on the second movable mass through a fifth set of electrodes placed near the second movable mass and anchored on the substrate, with the electrostatic force having a component that is linear to the relative position of the second movable mass and the substrate;

The the control loop of the circuitry is implemented by a loop that comprises at least a phase-detector, a low-pass filter, and the feedback control block that enables the second movable mass to resonate at or close to its natural resonant frequency the natural resonant frequency of said second movable mass along the pre-selected axis.